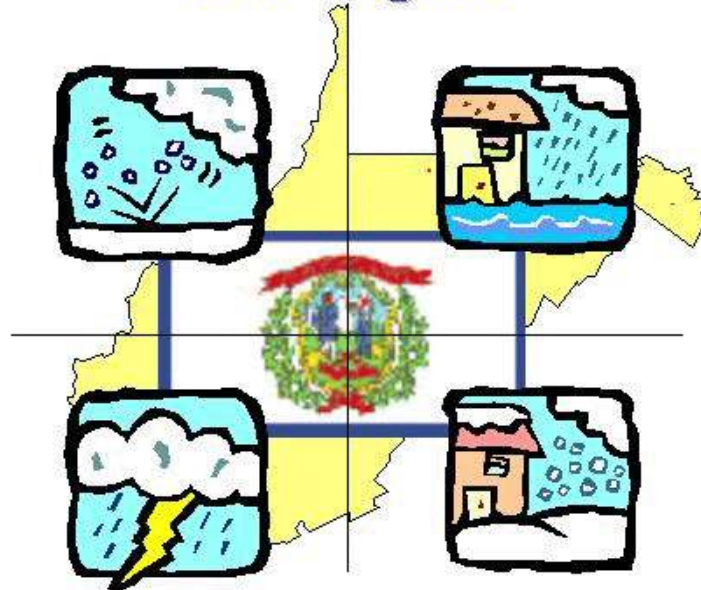


2004



West Virginia



Weather Awareness



CAMPAIGN



National Weather Service / March 21-27

Daily Campaign Messages

Sunday, March 21 -	Introduction To Campaign	
Monday, March 22 -	Flash Floods	
Tuesday, March 23 -	NOAA Weather Radio and Statewide Drill	
Wednesday, March 24 -	Low Water Crossing	[DRILL DAY]
Thursday, March 25 -	Thunderstorms & Lightning	
Friday, March 26 -	Lightning Safety Tips	
Saturday, March 27 -	Tornadoes	

Extra Copies of This Campaign Booklet Can
Be Downloaded From Our Web Site At
www.erh.noaa.gov/er/rly

Weather Related Fatalities in West Virginia 1993-2003

Floods/Flash Floods	42
Winter Weather	13
Lightning	5
Wind	2
Heat	1
Other	3

Fatalities directly related to or caused by weather

Annual Fatalities in WV

1993	3	1999	3
1994	11	2000	4
1995	5	2001	6
1996	12	2002	3
1997	6	2003	6
1998	7		



Nationwide Statistics

Warnings Issued in WV- 2003 (Preliminary)

Severe Thunderstorm -	251
Tornado -	5
Flash Flood -	228

Events - 2003 (Preliminary)

# confirmed tornadoes -	1
# severe events -	183
# flash floods -	166

Introduction

The message of this campaign is preparedness. Preparedness is everyone's job. Not just government agencies but all sectors of society – service providers, businesses, civic and volunteer groups, industry associations and neighborhood associations, as well as every individual citizen – should plan ahead for disaster. During the first few hours or days following a disaster, essential services may not be available. People must be ready to act on their own.

Everyone should have a family disaster plan – steps you can take to ensure the safety of your family. These steps include:

- ☐ Find out what types of disasters are most likely to occur in your community and how to prepare for them. This campaign will focus on severe weather but you should be just as prepared for other forms of disasters.
- ☐ Hold a family meeting. Families should get together to talk about the steps they'll take to be ready when disaster happens in their community.
- ☐ Take action. Each family member can be responsible for helping the family be prepared. Activities can include posting emergency telephone numbers, assembling disaster supply kits, taking first aid or CPR courses, and planning evacuation routes.
- ☐ Practice and maintain the plan. It is important that you practice the plan on a regular basis so family members will remember what to do when disaster strikes. There may not be much time in an actual emergency.

Flash floods are the #2 weather-related killer in the United States. On average, 146 people lose their lives every year due to flooding. That's equal to the next two weather killers combined (lightning and tornadoes).

West Virginia is no exception to this fact. In the last 11 years, 42 people have been killed in flash floods and floods. Deaths by lightning during the same period was five and there have been no deaths due to tornadoes.

We invite you to participate in this year's campaign....spread the word, learn safety steps you can take to protect yourself and family, develop a disaster plan.

Remember to be



For more information:

New Nationwide Campaign →
<http://www.nws.noaa.gov/os/water/tadd/>



Severe Weather Terms

Warning - A product issued by NWS local offices indicating that a particular weather hazard is either imminent or occurring. A warning indicates the need to take action to protect life and property. Typical warnings include:

- ◆ *Tornado Warning*
- ◆ *Severe Thunderstorm Warning*
- ◆ *Flash Flood/Flood Warning*
- ◆ *Excessive Heat Warning*

Watch - A NWS product indicating that conditions are favorable for the development of a particular severe weather event. A watch is normally issued for several hours and indicates a need for planning, preparation, and an increased awareness of changing weather conditions. Typical watches include:

- ◆ *Tornado Watch*
- ◆ *Severe Thunderstorm Watch*
- ◆ *Flash Flood/Flood*

Downburst - An exceptionally energetic downdraft that exits the base of a thunderstorm and spreads out at the earth's surface as strong and gusty horizontal winds that may cause property damage. Downbursts are much more common than you think and more likely than tornadoes in West Virginia.

Flash Flood - A flood that rises and falls quite rapidly. Flash Floods occur as the result of intense rainfall over a relatively small area in a short period of time.

Flood - The condition that occurs when water overflows the natural or artificial confines of a stream or body of water, or accumulates by drainage over low lying areas.

Funnel Cloud - Violently rotating column of air, but is not in contact with the ground. A tornado passes the funnel cloud stage during its development and dissipation.

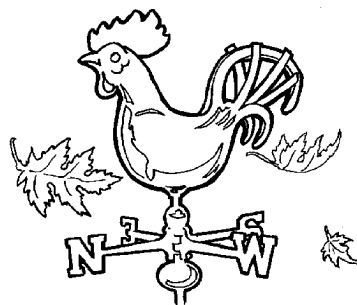
Gust Front - The leading edge of a mass of cool, gusty air that flows from the base of a thunderstorm (downburst) and spreads along the ground in advance of a thunderstorm.

Lightning - Generally, any and all of the various forms of electrical discharge produced by thunderstorms.

Severe Thunderstorm - A thunderstorm producing a tornado, damaging winds of 58 mph or greater, and/or hail 3/4 of an inch in diameter or larger.

Squall Lines -

Any line or narrow band of thunderstorms. These lines may be of considerable length, extending across multiple states.



Straight Line Winds - Typically used to describe thunderstorm wind damage that exhibits little rotational patterns to differentiate from the winds in a tornado that produce damage that exhibits rotational characteristics. Damage after a tornado could also appear to be straight line depending on speed of movement, size, and strength. Straight line winds are most often found with a gust front, originating from a downburst.

Thunderstorm - In general, a local storm produced by a cumulonimbus cloud, and always accompanied by lightning, thunder, gusty winds, possibly heavy rain and sometimes hail.

Tornado - Violently rotating column of air in contact with the ground, descending from the base of a severe thunderstorm. They are usually funnel-shaped, with a narrow end nearest the ground. In West Virginia, most tornadoes are obscured by hills, trees and rain until they are upon you. One rule of thumb used by spotters is, if the visible funnel extends more than halfway from the cloud to the ground, consider it a tornado...you may not see the visible funnel near the ground if it is weak or disorganized.



Coney Island, Welch, 2002



Flood Safety & Products

Flood Safety Rules

- * During periods of heavy rain, stay away from streambeds, drainage ditches, and culverts.
- * Never drive your car into water of unknown depths. Most flash flood deaths occur when people drive their vehicles into flood waters. Never go around barricades.
- * Water runs off streets and parking lots very rapidly causing natural and man-made drainage systems to overflow with rushing flood waters. These flood waters carry rocks, trees, trash, and other debris that can be deadly to someone in their path.
- * Move to high ground should flooding threaten your area. Heavy rain should be a signal to alert you to possible flooding danger. If you live or work in a flood-prone area, near streams, or drainage ditches, remain alert during periods of heavy rain.
- * Stay out of flooded areas. The water may still be rising and is usually swift. A rapidly flowing stream or ditch can sweep you off your feet or even sweep your car downstream. Children are especially vulnerable and should not be allowed to play or walk in flowing water.
- * Be especially cautious at night, when it is harder to recognize flood dangers.
- * If your vehicle stalls, abandon it and immediately seek higher ground. Flood waters may rise very quickly and could cover the vehicle or sweep it away.

Water is a very powerful force and should never be underestimated!



Types of Flood Watches and Warnings Issued by the National Weather Service

Watches

FLOOD WATCHES are issued when conditions are favorable for flash flooding (sudden short-term flooding).

FLOOD WATCHES are issued when conditions are favorable for long-duration flooding. This includes river flooding.

Warnings

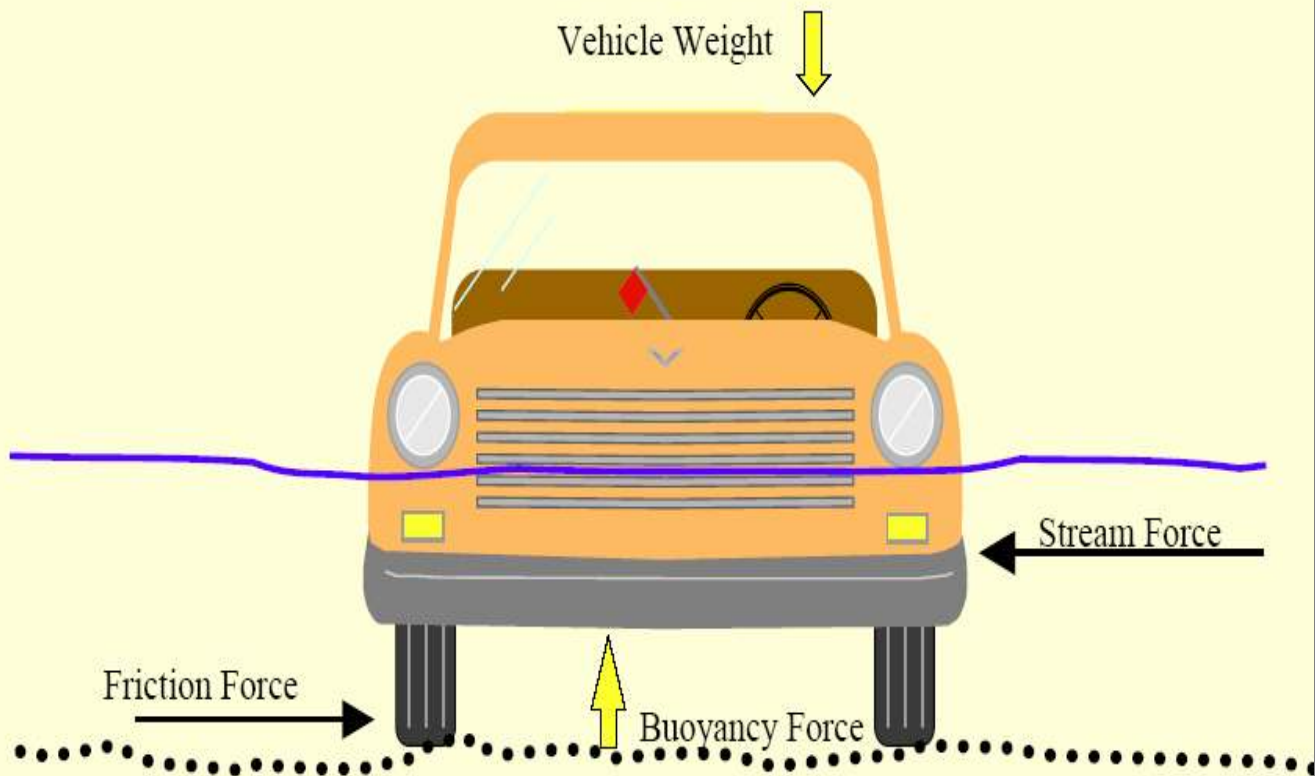
FLASH FLOOD WARNINGS are issued when short-term flooding occurs or is imminent.

FLOOD WARNINGS are issued when long-duration flooding is imminent and is expected to occur.

RIVER FLOOD WARNINGS are issued when flooding is occurring or expected to occur near streams and rivers.

Forces on Vehicles Crossing Streams

**The car will float downstream when:
Stream Force > Friction Force**



Courtesy Steve Waters, Senior Hydrologist, Flood Control District of Maricopa County



Flood Facts

✕Floods and flash floods are the leading weather-related killers in the United States after heat. In the past 30 years, floods have accounted for nearly double the fatalities as lightning. Flooding in West Virginia is a serious problem. Forty-two people have been killed in the last 11 years in floods and flash floods, six (6) in 2003.

✕Three types of flooding that occur in West Virginia:

General River Flooding occurs after long-term heavy rain, snow melt, or a combination of the two. It usually occurs slowly, allowing more time to move people and property to safety.

Flash Flooding is always life threatening and occurs very quickly as the name implies. Flash flooding typically occurs in hilly or mountainous areas, but can occur anywhere when heavy rain falls in a short period of time. Flash flooding can also be caused by a dam failure as was the case on February 26, 1972 along the Buffalo Creek in Logan County. After 3-4 inches of rain overnight, a slag dam failed killing 125 people.

Urban and Small Stream Flooding is a more subtle flood threat. It can occur when heavy rain falls in an urban or rural area, resulting in flooding streets, underpasses, or drainage ditches in an urban area, or creeks in rural areas. It is not normally a threat unless motorists drive through the flooded road or children play in flooded drainage ditches. Small stream flooding can be hazardous if persons get too close to a swollen creek.

✕Most flood-related deaths occur when people attempt to walk or drive into a flooded area. Many flood-related deaths also occur at night, when it is difficult to recognize the dangers of a water-covered road.

On February 17, 2003 a woman drowned while attempting to drive through high water from the Mud River in Lincoln County. Also a man drowned near Tornado in Kanawha County when he fell into the Coal River. On June 14, 2003, a boy was swept away while playing along Scratchers Creek in Marion County. During the evening of November 19, 2003, an elderly man fell into a swollen Island Creek and drowned. Earlier that day an elderly man drove his vehicle into flood waters from Mill Creek in Wayne County.

✕Trucks and four-wheel drive vehicles are also susceptible to being swept away by high water. Such vehicles often give motorists a false sense of security, believing they can drive through high water. This belief results in numerous deaths or emergency rescues of motorists in vehicles either stuck in or swept away by flood waters. *Twenty-two of the 42 deaths in flooding in the past decade was the result of driving vehicles through flooded roadways.*



Tug River near Williamson, 2002

Flood Safety Tips

Flood-related injuries and fatalities can be greatly reduced by increasing public awareness of the dangers involved in floods and flash floods. These tips can help protect you during flood events:

- Nationwide about 50% of flood deaths occur in motor vehicles (in West Virginia its 52%). Never attempt to drive into a flooded roadway. It only takes about two feet of water to float most cars. A common remark of motorists who survived driving over a flooded road and were swept away was that they only thought the water was a few inches deep. On May 18, 2001, a family of 4 crossed a rain swollen Buffalo Creek in their truck. Their truck rolled over several times. Two escaped, but the father and daughter drowned.



Flooding aftermath in Welch, 2002

- Even if the vehicle in front of you successfully crossed a water-covered road, it is best to find an alternative route or to wait. If you get stuck, you are not only risking your own life, but the lives of rescue personnel.
- Of the 42 deaths due to flooding in West Virginia in the past 11 years, 22 have been the result of driving vehicles through a flooded roadway.
- If you live in a low-lying area or near a creek, pay close attention to water levels during heavy rain events. Water rises rapidly during flash floods, often taking victims by surprise. Be prepared to move quickly to higher ground if water levels begin rising rapidly.
- Remember that just 6 inches of rapidly moving flood water can knock a person down.
- Never let children play near creeks or storm drains. Every year, deaths or injuries occur as a result of people getting swept into a creek or storm drain, with the most frequent victims being children.

On May 27, 2000, a 6-year old girl drowned after falling into a swollen culvert near her home in Montgomery Heights of Fayette County, West Virginia. She was swept through a drainage pipe and into the Kanawha River. On May 22, 2001, a 2-year old boy fell into a creek in Roane County and drowned. Again on July 29, a 3-year old boy fell into a rain swollen Jenny Branch in McDowell County and drowned.

- If you are camping, never set up your tent or camper right on the bank of a river or creek. It is best to allow some distance and elevation between your campsite and the creek, so if a flash flood does occur, you will have more time to move to higher ground.

Thunderstorms/Lightning Facts

Thunderstorms are a common spring and summer occurrence throughout West Virginia. Thunderstorm winds and lightning kill more people each year than tornadoes. In fact, it's been over 18 years since someone was killed by a tornado in this state.

On March 13, 2003, lightning entered the second floor of the Mount Hope School in Fayette County. Most students had already gone home, however there were still 30 to 40 students in the building for after-school programs. Eight children were slightly injured as a result of flash burns to the eyes and flying glass. The electrical surge destroyed two computer systems with 27 monitors. Five television sets and 2 video recorders were also destroyed. A dozen windows were broken. Broken water pipes flooded 2 rooms.

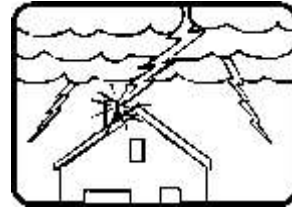
- ✓ Over a 30-year time period, lightning has caused approximately 83 deaths in the United States each year.
- ✓ All thunderstorms produce lightning. Lightning often strikes outside of heavy rain and may occur as far as 10 miles away from any rainfall.
- ✓ Most lightning occurs within the cloud or between the cloud and ground.
- ✓ Lightning results from the buildup and discharge of electrical energy between positively and negatively charged areas. The action of rising and descending air within a thunderstorm separates positive and negative charges.
- ✓ West Virginia experiences thunderstorm activity an average of 30 to 50 days annually.
- ✓ The typical thunderstorm is 15 miles in diameter and lasts 20-30 minutes.
- ✓ Nearly 1,800 thunderstorms occur at any moment around the world. That's 16 million storms per year.
- ✓ Of the estimated 100,000 thunderstorms that occur each year in the United States, only about 10% are classified severe.
- ✓ Severe thunderstorms can produce damaging winds as strong as the winds in a weak tornado and can be life threatening.
- ✓ A severe thunderstorm can produce hail that is 3/4 inch in diameter or larger, winds of 58 miles per hour or higher, or tornadoes.
- ✓ Large hail causes nearly \$1 billion in damage to property and crops annually.
- ✓ The costliest U.S. hailstorm occurred in Denver on July 11, 1990, which produced a total hail damage estimated at \$625 million.
- ✓ Lightning strikes the earth 100 times each second.



Thunderstorms/Lightning Safety Tips

The following safety tips can protect you during a thunderstorm:

✓If you can hear thunder, you are close enough to the storm to be struck by lightning. Go to a safe shelter immediately, such as a sturdy building or car. Do not take shelter in small sheds, under isolated trees, or in convertible automobiles.



✓Telephone lines and metal pipes can conduct electricity. Unplug appliances not necessary for obtaining weather information. Avoid using electrical appliances. Use phones ONLY in an emergency.

✓Turn off air conditioners. Power surges from lightning can overload the compressors.

✓Do not take a bath or shower. Water is an electrical conductor.

If caught outdoors and no shelter is nearby:

✓If lightning is occurring and a shelter is not available, get inside a hard top automobile and keep the windows up.

✓If no automobile is available, find a low spot away from trees, fences and poles. Be alert to the possibility of flash flooding.

✓If you are in the woods, take shelter under short trees or bushes.

✓If you feel your skin tingle or your hair stand on end, squat low to the ground on the balls of your feet. Place your hands on your knees with your head between them. Make yourself the smallest target possible and minimize your contact with the ground.

✓If you are boating or swimming, get to land and find shelter immediately.

✓Stay away from open outdoor spaces.

Heat Safety Tips

✓Slow down. Strenuous activities should be reduced, eliminated, or rescheduled to the coolest time of the day. Individuals at risk should stay in the coolest available place, not necessarily indoors.

✓Drink plenty of water or other non alcoholic fluids. Your body needs water to keep cool. Drink plenty of fluids even if you don't feel thirsty.

✓Don't get too much sun. Sunburn makes the job of heat dissipation that much more difficult.

Tornado Facts

- ▼ A tornado is a violently rotating column of air extending from a thunderstorm to the ground.
- ▼ The most violent tornadoes are capable of tremendous destruction with wind speed of 250 miles per hour or more.
- ▼ The average tornado moves from the southwest to northeast, but tornadoes have been known to move in any direction.
- ▼ The average forward speed of a tornado is 30 miles per hour, but may vary from nearly stationary to 70 miles per hour!
- ▼ Tornadoes can occur throughout the year, however, the peak season in West Virginia is April through July.
- ▼ Tornadoes are most likely to occur between 2 p.m. and 10 p.m., but have been known to occur at any hour, day or night.
- ▼ Tornadoes can be classified into one of three types:
 - Weak Tornadoes (F0/F1) - account for more than 95% of all tornadoes in West Virginia; cause less than 5% of tornado deaths; lifetime is usually from less than one minute to a few minutes with a path length of from ½ mile to 2 miles; wind speeds are less than 113 mph.
 - Strong Tornadoes (F2/F3) - account for the remaining 5% of all tornadoes in West Virginia; cause nearly 30% of all tornado deaths; may last 10 minutes or longer with a path length of several miles; wind speeds are 113 to 206 mph.
 - Violent Tornadoes (F4/F5) - are extremely rare in West Virginia; cause 70% of all tornado deaths; may last for one hour or more; wind speeds are greater than 206 mph.
- ▼ West Virginia averages 2 tornadoes per year.
- ▼ National Weather Service offices in Charleston, Pittsburgh, Sterling (Virginia), and Blacksburg (Virginia) provide warnings for West Virginia.
- ▼ The Weather Service uses Doppler weather radars to sense the air movement within thunderstorms. Early detection of increasing rotation aloft within a thunderstorm can allow lifesaving warnings before the tornado forms.



Damage in Tyler County from a tornado May 23, 2000.



Overview:

To help Americans guard against the ravages of severe weather, the National Weather Service has designed StormReady, a program aimed at arming America's counties with the communication and safety tools necessary to save lives and property. The entire county - from the county commissioners, emergency managers, to business leaders and civic groups - can take the lead on becoming StormReady. Local National Weather Service forecast offices work with counties to complete an application and review process and help them meet specific objectives.

- Ninety percent of all presidentially declared disasters are weather related. This severe weather results in around 500 deaths per year and nearly \$14 billion in direct damage costs. The total economic costs average over \$50 billion per year, according to the National Science Foundation. The National Weather Service watches out for the nation during severe weather, but it's what communities do before the threatening weather strikes that saves lives and property.
- The StormReady program addresses the need for a new level of community awareness to protect life and property from extreme weather.
- The partnership between local National Weather Service forecasters, the television and radio stations and area emergency managers saves hundreds of lives every year.
- Storm Ready improves communication and increases awareness and preparedness in a county.
- StormReady provides detailed and clear recommendations which counties use to improve their hazardous weather related and public awareness programs. It also gives the county recognition for their preparedness accomplishments.
- StormReady prepares counties with an action plan that responds to the threat of all types of severe weather.
- To be officially StormReady, a county must:

- Establish a 24-hour warning point and emergency operations center;
 - Have more than one way to receive severe weather forecasts and warnings and to alert the public;
 - Create a system that monitors local weather conditions;
 - Promote the importance of public readiness through community seminars;
 - Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.
- **Storm Ready Certification Process**
 - An advisory board, comprised of National Weather Service warning coordination meteorologists, and state and local emergency managers, will review applications from counties and visit the locations to verify the steps made in the process to become StormReady. StormReady counties must stay freshly prepared, because the designation is only valid for three years.
 - Counties interested in StormReady should contact their local National Weather Service Forecast Office or visit the web page: <http://www.nws.noaa.gov/stormready>.

An important change...StormReady counties participating in FEMA's National Flood Insurance Program (NFIP) may receive up to 25 Community Rating Points toward lowering flood insurance rates. More information on the NFIP and the Community Rating System is at: www.fema.gov/nfip/crs



The very first StormReady county in West Virginia... Randolph County...receiving their recognition in May, 2001.

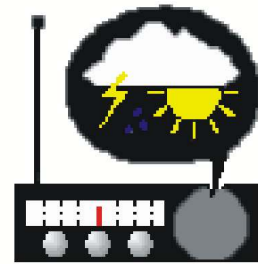
Benefits of NOAA Weather Radio

- An important element of severe weather safety is NOAA Weather Radio. The National Weather Service broadcast advance warnings over NOAA Weather Radio for all severe weather.



Mark Trail image courtesy of North American Syndicate, Inc.,
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- We could have the best warnings in the world, but if we can't alert you to the need to take action they are useless. When severe weather strikes, especially at night, NOAA Weather Radio saves lives. There are many stories of survival thanks to NOAA Weather Radio. The plant workers in Haysville, Kansas in May 1999, the large group of fans at a packed high school gymnasium in BeBe, Arkansas in January 1999, and a veterinarian's family in Georgia in February 2000, will all tell you there is no longer any doubt that NOAA Weather Radio saves lives.



Weather Radio broadcasts, however only 5 to 10 percent actually own a NOAA Weather Radio.

- NOAA Weather Radios should be as common as smoke detectors.

The next page graphically shows the Weather Radio coverage across West Virginia. More information is available by contacting the National Weather Service office closest to you or by checking the national web site at <http://www.nws.noaa.gov/nwr>



Weather Radio Frequencies and Coverage



WXJ-84 Charleston 162.400



WXM-74 Sutton 162.45



WXM-70 Garfield 162.500



KZZ-46 Athens 162.425



WXM-71 Beckley 162.550



WXJ-85 Clarksburg 162.550



KIH-39 Ashland 162.550



WXM-75 Gilbert 162.475



KXI-74 Monterville 162.525

Other Transmitters Serving West Virginia

WXM-73 Moorefield 162.400 covers Grant, Hampshire, Hardy, Mineral counties (programmed by Sterling NWS office)

KKI-73 Parsons 162,450 covers Tucker, Preston, Barbour, Randolph, Grant (programmed by Pittsburgh)

WXM-42 Hagerstown 162.475 covers Morgan, Berkely, Jefferson counties (programmed by Sterling)

WXM-72 Hinton 162.425 covers Greenbrier, Mercer, Monroe, Pocahontas, Summers counties (programmed by Blacksburg, VA)

KIH-35 Pittsburgh 162.550 covers Brooke, Hancock, Ohio counties (programmed by Pittsburgh)

WXJ-47 Cambridge 162.475 covers Marshall, Ohio, Tyler counties (programmed by Pittsburgh)

KWN-35 Morgantown 162.475 covers Monongalia, Preston, Marion, Wetzel, Harrison, Taylor counties (programmed by Pittsburgh)

KWVN-36 Greg Knob 162.500 covers Preston, Monongalia, Tucker, Marion, Taylor, Barbour (programmed by Pittsburgh)

Contacts

National Weather Service

Charleston - Dan Bartholf (304) 746-0180 e-mail:
daniel.bartholf@noaa.gov

400 Parkway Rd.
Charleston, WV 25309 Internet:
<http://www.erh.noaa.gov/er/rlx/>

Pittsburgh - Rich Kane (412) 262-1591
192 Shafer Rd.
Coraopolis, PA 15108 Internet:
<http://www.erh.noaa.gov/er/pit/>

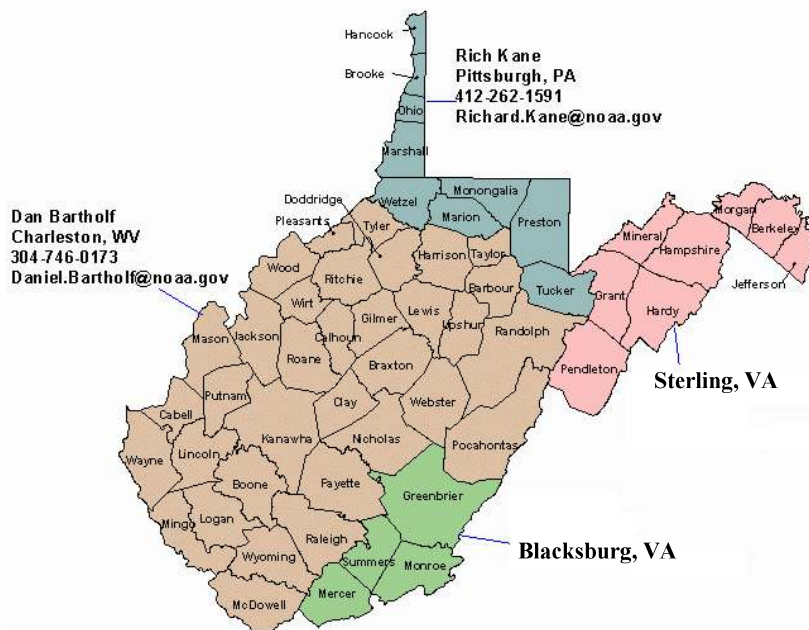
Blacksburg, VA - (540) 552-1613

VA Tech Corp. Research Ctr.
1750 Forecast Dr.
Blacksburg, VA 24060 Internet:
<http://www.erh.noaa.gov/er/rnk>

Sterling, VA - (703) 260-0209
44087 Weather Service Rd.
Sterling, VA 20166 Internet: <http://www.erh.noaa.gov/lwx/>

West Virginia Office of Emergency Services

Yvonne Shephard
Bldg. 1, Room EB-80, 1900 Kanawha Blvd. East, Charleston, WV 25305-0360
(304) 558-5380



Drill Day, Wednesday, March 24 at 9:50 AM

The drill this year will be for all hazards. At drill time we ask that each agency, school, manufacturing facility, and others practice for a particular form of hazard. It could be a flash flood, severe thunderstorm, tornado, or some other event. Carry out your preplans...critique your drill...and discuss it. Make changes if necessary. The idea of the drill is to prepare for emergencies before they happen.

Other Drills

Other states will be conducting drills during the month.

Ohio - Wednesday, March 24 9:50 am
Kentucky - Tuesday, March 9 10:07 am
Virginia - Tuesday, March 16 9:45 am

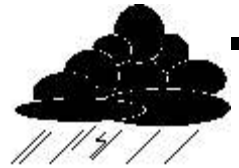
Additional Resource Material

For additional material check our web site for a complete list of pamphlets and flyers.

West Virginia Spring Severe Weather Awareness Campaign
March 21-27, 2004



Severe Weather Drill Day
Wednesday, March 24
at 9:50 a.m.



National Weather Service
400 Parkway Road
Charleston, WV 25309

TO:

FIRST CLASS MAIL

2004 West Virginia Spring Weather Awareness Campaign